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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,943	04/11/2005	Yoshinobu Suehiro	PTGF-04078US	2058

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EXAMINER	
MAKIYA, DAVID J	
ART UNIT	PAPER NUMBER
2885	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/521,943	SUEHIRO ET AL.	
	Examiner	Art Unit	
	David J. Makiya	2885	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 January 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No: _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 10-17, 19-22, and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US Patent 6,578,998) in view of Newby (US Patent 6,999,318).

With respect to claims 1 and 15-16, Zhang teaches a light emitting apparatus, comprising a light source section 21 comprising a solid-state light emitting element (Column 1, Lines 47-49); a power supply section (31, 15) that supplies power to the light source section (Column 3, Lines 5-6, 41-50); a reflection section 11 that is disposed opposite to a light extraction surface of the light source section to reflect light emitted from the light source section (Figure 2); and a heat radiation section 31 that is disposed with a heat radiation width in a back direction of the light source section (Column 2, Lines 57-67). However, Zhang fails to teach the light emitting apparatus comprising an insulating layer disposed between the power supply section and the heat radiation section. Newby teaches a light emitting apparatus comprising a light source section 24 comprising a solid-state light emitting element; a power supply section 42; a heat radiation section 46 that is disposed with a heat radiation width in a back direction of the light source section (Figure 3); an insulating layer 48 disposed between the power supply section and the heat radiation section (Figure 3; Column 3, Lines 45-48); and the power supply section comprises a metallic thin film (14, 15) disposed with a width in the back direction and is sandwiched through

an insulator between a plurality of heat radiation plates to compose the heat radiation section (Figure 3). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of Zhang with the teachings of Newby because an insulating layer would "avoid air bubbles or other interface anomalies that might increase the interfacial thermal impedance" (Newby; Column 3, Lines 39-48) and "improves the thermal coupling of the device 20 to the heatsink 46" (Newby; Column 4, Lines 6-9).

With respect to claim 2, Zhang teaches a light emitting apparatus, comprising a light source section 21 comprising a solid-state light emitting element (Column 1, Lines 47-49); a power supply section (31, 15) that supplies power to the light source section (Column 3, Lines 5-6, 41-50); a reflection section 11 that is disposed opposite to a light extraction surface of the light source section to reflect light emitted from the light source section (Figure 2); a heat radiation section 31 that is disposed with a heat radiation width in a back direction of the light source section (Column 2, Lines 57-67); and a case 12 in which the reflection section and the radiation section are placed and which externally radiates heat to be transferred from the heat radiation section (Column 3, Lines 13-21). However, Zhang fails to teach the light emitting apparatus comprising an insulating layer disposed between the power supply section and the heat radiation section. Newby teaches a light emitting apparatus comprising a light source section 24 comprising a solid-state light emitting element; a power supply section 42; a heat radiation section 46 that is disposed with a heat radiation width in a back direction of the light source section (Figure 3); and an insulating layer 48 disposed between the power supply section and the heat radiation section (Figure 3; Column 3, Lines 45-48). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of

Zhang with the teachings of Newby because an insulating layer would "avoid air bubbles or other interface anomalies that might increase the interfacial thermal impedance" (Newby; Column 3, Lines 39-48) and "improves the thermal coupling of the device 20 to the heatsink 46" (Newby; Column 4, Lines 6-9).

With respect to claim 3, Zhang teaches the light emitting apparatus wherein the heat radiation section comprises a same material as the case (Column 2, Lines 7-17 and Column 3, Lines 13-21).

With respect to claim 4, Zhang teaches the light emitting apparatus wherein the light source section is packaged 221 such that the solid-state light emitting element is sealed with a light transmitting material (Column 3, Lines 35-40).

With respect to claim 5, Zhang teaches the light emitting apparatus wherein the light source section is packaged 221 such that the solid-state light emitting element is sealed with a light transmitting material (Column 3, Lines 35-40).

With respect to claim 10, Zhang teaches the light emitting apparatus wherein the case comprises a high reflectivity surface to reflect the light (Column 3, Lines 13-21).

With respect to claim 11, Zhang teaches the light emitting apparatus wherein the case comprises a surface that is subjected to a finishing to increase its heat radiation area (Column 3, Lines 13-21 and Figure 4).

With respect to claim 12, Zhang teaches the light emitting apparatus wherein the heat radiation section comprises a heat radiation plate that comprises a high reflectivity surface to reflect the light (Column 3, Lines 13-21).

With respect to claim 13, Zhang teaches the light emitting apparatus wherein the heat radiation section comprises a heat radiation support 31 that comprises a high thermal conductivity material and transfers to the heat radiation section heat generated from the light source section, and a heat radiation plate that transfers the heat through the heat radiation support (Column 3, Lines 62-67).

With respect to claim 14, Zhang teaches a light emitting apparatus, comprising a light source section 21 comprising a solid-state light emitting element (Column 1, Lines 47-49); a power supply section (31, 15) that supplies power to the light source section (Column 3, Lines 5-6, 41-50); a reflection section 11 that is disposed opposite to a light extraction surface of the light source section to reflect light emitted from the light source section (Figure 2); and a heat radiation section 31 that is disposed with a heat radiation width in a back direction of the light source section (Column 2, Lines 57-67), wherein the power supply section is formed with a width in the back direction of the light source section (Figure 2). However, Zhang fails to teach the light emitting apparatus comprising an insulating layer disposed between the power supply section and the heat radiation section. Newby teaches a light emitting apparatus comprising a light source section 24 comprising a solid-state light emitting element; a power supply section 42; a heat radiation section 46 that is disposed with a heat radiation width in a back direction of the light source section (Figure 3); and an insulating layer 48 disposed between the power supply section and the heat radiation section (Figure 3; Column 3, Lines 45-48). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of Zhang with the teachings of Newby because an insulating layer would "avoid air bubbles or other interface anomalies that might increase the interfacial thermal impedance"

(Newby; Column 3, Lines 39-48) and "improves the thermal coupling of the device 20 to the heatsink 46" (Newby; Column 4, Lines 6-9).

With respect to claim 17, Zhang teaches the light emitting apparatus wherein a spectrum light with a plurality of region wavelengths is radiated form the solid-state light emitting element or from the periphery of the solid-state light emitting element (Column 3, Lines 32-34).

With respect to claim 19, Zhang teaches the light emitting apparatus wherein the heat radiation section has the heat radiation width that is three times or more its thickness (Figure 1).

With respect to claim 20, Zhang teaches the light emitting apparatus wherein the light source section including the solid-state light emitting element has a width that is within five times that of the solid-state light emitting element (Figure 3).

With respect to claim 21, Zhang teaches the light emitting apparatus wherein the heat radiation section comprises a shape that protrudes toward a bottom of the reflection surface (Figure 2).

With respect to claim 22, Zhang teaches the light emitting apparatus wherein the reflection surface opposite to the light source section comprises a solid angle of 2π to 3.4π strad (Figure 2).

With respect to claim 24, Zhang teaches the light emitting apparatus wherein the reflection section does not comprise a resin section (Column 4, Lines 1-9). However, Zhang does state that using a resin section would be conventional, but in this case unnecessary to "simplify the process and reduce the manufacturing cost."

With respect to claim 25, Zhang teaches the light emitting apparatus wherein the light source section comprises a plurality of solid-state light emitting elements (21', Figure 6).

With respect to claim 26, Zhang teaches the light emitting apparatus wherein the light emitting apparatus comprises a plurality of light source sections 21', and a plurality of reflection sections 13' and the heat radiation sections corresponding to the plurality of the light source sections (Figures 5 and 6)..

With respect to claim 27, Zhang teaches the light emitting apparatus wherein the plurality of the light source sections generate a plurality of emission colors (Column 5, Lines 38-55).

With respect to claim 28, Zhang teaches the light emitting apparatus wherein the plurality of the light source sections generate emission colors of R, G, and B (Column 5, Lines 38-55).

Claims 6 -8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Newby as applied to claim 1 above, and further in view of Suehiro et al. (US 2002/0024808), Bukosky (US Patent 6,076,948), and Chen (US Patent 6,733,156).

With respect to claims 6-8, Zhang teaches the device as described above wherein the light source section comprises the solid-state light emitting element that is flip-chip 21 (Figure 3) and the light source section is sealed 221 with a light transmitting material (Column 3, Lines 35-40). Newby further teaches the light source section is mounted on an inorganic material board on which a conductive pattern is formed to supply power to the solid state light emitting element (Column 1, Lines 47-55). However, Zhang in view of Newby fails to teach the type of material. Suehiro et al. teaches a light emitting apparatus wherein a "light emitting element is encapsulated with an encapsulating member made of an inorganic and light transmissive material such as epoxy resin and glass" (Paragraph 78). Bukosky et al. teaches a light emitting apparatus wherein a substrate 50 on which a light emitting diode 30 is located is also commonly made out of glass (Column 6, Lines 18-24). Chen teaches the use of an epoxy resin 33 to protect and seal a LED

chip 5 to a material board 2 (Column 2, Lines 41-62). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the type of material because glass is a commonly used inorganic material where "light from the light emitting element is emitted after the light is transmitted in the encapsulating member and is refracted on the surface" (Suehiro et al.; Paragraph 78) and to have a material board seal the light emitting element while bonding in chemical reaction to the inorganic seal material because the "LED chip 5 is electrically connected" and also uses "a protection layer" (Chen; Column 2, Lines 39-44) to prevent damage.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang in view of Newby as applied to claim 1 above, and further in view of Gorczyca (US Patent 6,800,373).

With respect to claim 9, Zhang in view of Newby teaches the light emitting apparatus wherein the solid-state light emitting element is sealed, but fails to teach the refractive index. Gorczyca teaches a light emitting diode 1 with a solid-state light emitting element 4 and a inorganic seal material 14 (Column 10, Lines 60-66) wherein the refractive index is 1.55 or more (Column 8, Line 65-Column 9, Line 9). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of Zhang with the teachings of Gorczyca because a high refractive index would "increase in the amount of emitting light...without significantly affecting the transparency of the epoxy encapsulant" (Gorczyca; Column 9, Lines 4-9).

Claim 18 is rejected under 35 U.S.C. 103(a) as being obvious over Zhang in view of Newby as applied to claim 17 above, and further in view of Lowery (US Patent 5,959,316).

With respect to claim 18, Zhang in view of Newby teaches the light emitting apparatus as described above, but fails to teach a phosphor disposed on the periphery of the element. Lowery teaches a light emitting apparatus comprising a light emitting diode 18 and a phosphor 52 disposed on the periphery of the solid-state light emitting element. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of Zhang with the teachings of Lowery because "most of the blue light at 470 nm strikes the phosphors in the fluorescent material, and that light would be up-shifted such that the secondary green and red lights complement the residual blue light which escapes past the phosphors. This provides a final combination of light which appears as white to the human eye" (Lowery; Column 1, Lines 21-27).

Claim 23 is rejected under 35 U.S.C. 103(a) as being obvious over Zhang in view of Newby as applied to claim 1 above, and further in view of Camras et al. (US Patent 6,784,463).

With respect to claim 18, Zhang in view of Newby teaches the light emitting apparatus as described above, but fails to teach the light source with a turn-on power of 1W or more. Camras et al. teaches a light emitting diode 100 with a turn-on power of 2.0 W. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of Zhang with the teachings of Camras et al. because "the electrical power input to the devices may be further increased for larger active area devices. Consequently, the disclosed light-emitting devices may provide higher flux than conventional III-Phosphide and III-Arsenide light-emitting devices" (Camras et al.; Column 10, Lines 8-24).

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Newby in view of Zhang.

With respect to claim 29, Newby teaches a light emitting apparatus, comprising a light source section 24 comprising a solid-state light emitting element; a power supply section 42 that supplies power to the light source section; a heat radiation section 46 that is disposed with a heat radiation width in a back direction of the light source section, wherein the heat radiation section is separated from the power supply section (Figure 3). However, Newby fails to teach a reflection section that is disposed opposite to a light extraction surface. Zhang teaches a light source section 21 comprising a solid-state light emitting element (Column 1, Lines 47-49); a power supply section (15, 31); a heat radiation section 31 that is disposed with a heat radiation width in a back direction of the light source section (Column 2, Lines 57-67) and a reflection section 11 that is disposed opposite to a light extraction surface of the light source section to reflect light emitted from the light source section (Figure 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus of Newby with the teachings of Zhang because adding a reflector makes "a light source arrangement which is capable of providing light intensity up to five times of a conventional LED" (Zhang; Column 1, Lines 46-49).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 14, and 29 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim of copending Application No. 11/411,144. Although the conflicting claims are not identical, they are not patentably distinct from each other because a lead could be the power supply section, an LED is a solid-state light emitting element and it has a reflector and heat radiation section.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

Applicant's arguments filed 12/13/2006 have been fully considered but they are not persuasive.

In response to applicant's arguments in regards to the radiation section and the case, Zhang teaches "Heat is efficiently dissipated by the supporting frame when a larger current is applied to the light source arrangement" (Abstract), the "supporting frame comprising a supporting bride, which has a thin thickness and a predetermined width functioning as a heat sink" (Column 2, Lines 7-17), and "the entire cell body can be made of light reflecting material such as aluminum, silver, or titanium to provide the light projecting surface 14" (Column 3, Lines 18-21). Zhang would therefore have a radiation section 21 and a case 12 that externally radiate heat because it is made of a metal i.e. "aluminum, silver, or titanium" that all inherently

have high thermal conductivities. However, Zhang fails to teach the light emitting apparatus comprising an insulating layer disposed between the power supply section and the heat radiation section. Newby teaches a light emitting apparatus comprising a heat radiation section that is disposed with a heat radiation width in a back direction of the light source section and an insulating layer disposed between the power supply section and the heat radiation section. Zhang is therefore modified with the teachings of Newby because it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the light emitting apparatus because an insulating layer would "avoid air bubbles or other interface anomalies that might increase the interfacial thermal impedance" (Newby; Column 3, Lines 39-48) and "improves the thermal coupling of the device 20 to the heatsink 46" (Newby; Column 4, Lines 6-9).

In response to applicant's argument that Bukosky is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Bukosky has a light source section, power supply section, and reflection section disposed opposite to a light extraction surface of the light source section. Bukosky would clearly be analogous art relative to Zhang and Newby.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sugimoto et al. (US Patent 6,874,910) and Boutoussov et al. (US Patent 6,439,888) teach light emitting diodes with insulators between the lights and heat radiation section.

Jacobson et al. (US 2005/0168994) and Mayer et al. (US Patent 7,131,760) teach light emitting apparatuses with light source sections, reflection sections, and heat radiation sections.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David J. Makiya whose telephone number is (571) 272-2273. The examiner can normally be reached on Monday-Friday 7:30am - 4:00pm (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong (James) Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJM 03/07/2007

JOHN ANTHONY WARD
PRIMARY EXAMINER